

REMARKS

Claims 1-33 are pending in the above-referenced application. Claims 24-33 have been withdrawn from consideration. Claims 1-10, 14-16, 18, and 20-22 are rejected. Claims 11-13, 17, 5 19, and 23 are objected to. The Office Action is non-final. More specifically and in accord with the item numbers therein, the Office Action has:

In Item 1, acknowledged Applicant's election with traverse, but has found it non-persuasive and thus made the restriction requirement final;

10 In Item 2, rejected claims 1-10, 14-16, 18 and 21-22 under 35 U.S.C. 102(e) as being anticipated by Choi (U.S. Patent No. 6,538,367); and

In Item 3, indicated that claims 11-13, 17, 19 and 23 are allowable, if rewritten in dependent form including all of the limitations of the base claim and any intervening claims.

15 Applicant has cancelled claims 1-33 without prejudice or surrender of subject matter and added claims 34 to 64. Reconsideration is requested in light of added claims and remarks. The new independent claims are 34, 35, 54, and 60, the first corresponding to allowable subject matter rewritten in independent form. Claim 35 is an amended version of originally-submitted claim 1 and claim 60 is an amended version of originally-submitted claim 20. Claim 54 is new.

20 With respect to Item 2 and regarding claims 35 and 60, Applicant submits that the Choi '367 reference fails to teach each and every limitation of Applicant's invention as recited in those claims, because the reference fails to teach the limitation "a gate electrode disposed over the insulator and having one or plurality of apertures, wherein each aperture is concentrically self-aligned with the end of one of the nano-structures, so as to expose a single nanostructure and 25 provide each nano-structure with substantially the same emitter-to-gate distance, the gate electrode being operative to control the emission of electrons through the apertures from the exposed nano-structures," which is present in both claims. Applicant's invention achieves this resulting structure because of the way it is fabricated. In contrast, the reference teaches the use of a particle masking technique to achieve a gate aperture structure. However, the particle masking 30 techniques taught in the reference cannot achieve the limitation set forth and therefore the

reference does not teach such a structure. First, the technique in the reference purposefully includes a multiplicity of nanoconductors in each aperture. Choi, Col. 7, line 64 to Col. 8, line 3. In contrast, Applicant's invention, in claims 35 and 60, recites that each of the apertures is concentrically self-aligned with a protruding portion so as to expose the end thereof. Second, the 5 technique in the reference does not contemplate the alignment of an aperture about each one of the nano-structures. This is clear from FIG. 11 of the reference and the description of the particle mask technique. Clearly, the range in the size of the particles (1-5 μm) is such that multiple nano-structures will become exposed by the aperture and thus there is no concept of aligning the aperture with those multiple structures. Choi, Col. 8, lines 46-53. Therefore, the Choi reference 10 fails to teach each and every limitation of Applicant's invention as recited in claims 35 and 60.

With respect to claim 54, Applicant further submits that the Choi reference fails to teach the limitation "a plurality of gating means, disposed over the insulator, for controlling the flow of electrons emitted by the nano-structure emitting means, each of the plurality of said gating means arranged symmetrically relative to one of the plurality of nano-structure emitting means." 15 In the reference, there is no possibility that the structures achievable therein could have each gating means arranged symmetrically with respect to one of the nano-structures, as the reference only contemplates a plurality of nano-structures in each aperture. Choi, Col. 7, line 64 to Col. 8, line 3. Therefore, the reference fails to teach each and every limitation of claim 54.

With respect to claims 36-53, Applicant submits that these claims are allowable at least 20 because claim 35, from which they depend, is allowable. Additionally, Applicant submits that the Choi reference fails to teach the limitation "wherein the nano-structures protrude above the surface of the emitting layer for not more than half of one micrometer," in claim 40 or the limitation "wherein the apertures in the insulator expose the entire protrusion portion of the 25 nano-structures in the emitting layer," in claim 41, as nothing in Choi teaches or describes any such a protrusion. Additionally, Choi fails to teach or describe the limitation "wherein the nano-structures have a coating for enhanced field emission performance," recited in claim 44. Additionally, Choi fails to teach the limitation "wherein the nano-structures comprise a nonconductive core and a conductive shell," as recited in claim 47 or the limitation "wherein the 30 nonconductive core is made from one of wide band gap semiconductors, including diamond, BN, AlN, AlGaN, GaN, GaAs, SiC, ZnO," recited in claim 48. In fact, the Examiner has indicated

that the limitations of claim 44 would make the claims allowable if rewritten in independent form. This Applicant has done in claim 34.

Additionally, the Choi reference fails to teach the limitation “wherein the embedding material is comprised of at least two layers,” recited in claim 49, or the limitation “wherein the first layer of the embedding material is conductive,” recited in claim 50, as Choi fails to describe any features of any embedding material. Additionally, Choi fails to teach the limitation “wherein the insulator and the embedding material are composed of the same dielectric material” in claim 51 or the limitation “wherein said insulator functions also as the embedding material,” in claim 52, again because Choi fails to describe any features of any embedding material. Additionally, Applicant submits that claim 53 is allowable because the Choi reference fails to teach the limitation “wherein the gate electrode is configured as a plurality of electrically isolated electrodes, each intersecting with said cathode electrodes,” because Choi does not describe the arrangement of intersecting electrodes. In fact, the Examiner has indicated that the limitation of claims 51 and 53 would be allowable if rewritten in independent form.

With respect to claims 55-59, Applicant submits that these claims are allowable at least because claim 54, from which they depend, is allowable.

With respect to claims 61-64, Applicant submits that these claims are allowable at least because claim 60, from which they depend, is allowable. Additionally, Applicant submits that the Choi reference fails to teach the limitation “wherein the cathode electrode is configured as a plurality of strip-like cathode electrodes...wherein the gate electrode is configured as a plurality of strip-like gate electrodes extending in such a manner as to intersect said plurality of cathode electrodes,” recited in claim 64, because Choi describes no such arrangement of intersecting cathodes and gates. In fact, the Examiner has indicated that the limitation of claim 64, would be allowable if rewritten in independent form.

With respect to claims 34, as mentioned above, Applicant has rewritten originally submitted claim 11 in independent form. Applicant therefore believes these claims are allowable.



Thus, in light of the above, Applicants respectfully request reconsideration and allowance of the pending claims and the new claims in the above-mentioned application.

Date: August 8, 2005

Respectfully submitted

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A handwritten signature in black ink that appears to read "Anthony B. Diepenbrock".

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Date: August 8, 2005

A handwritten signature in black ink that appears to read "Sushma S. Brady".

Sushma S. Brady